Getting Started:
Installing the SPOT Hardware and Software

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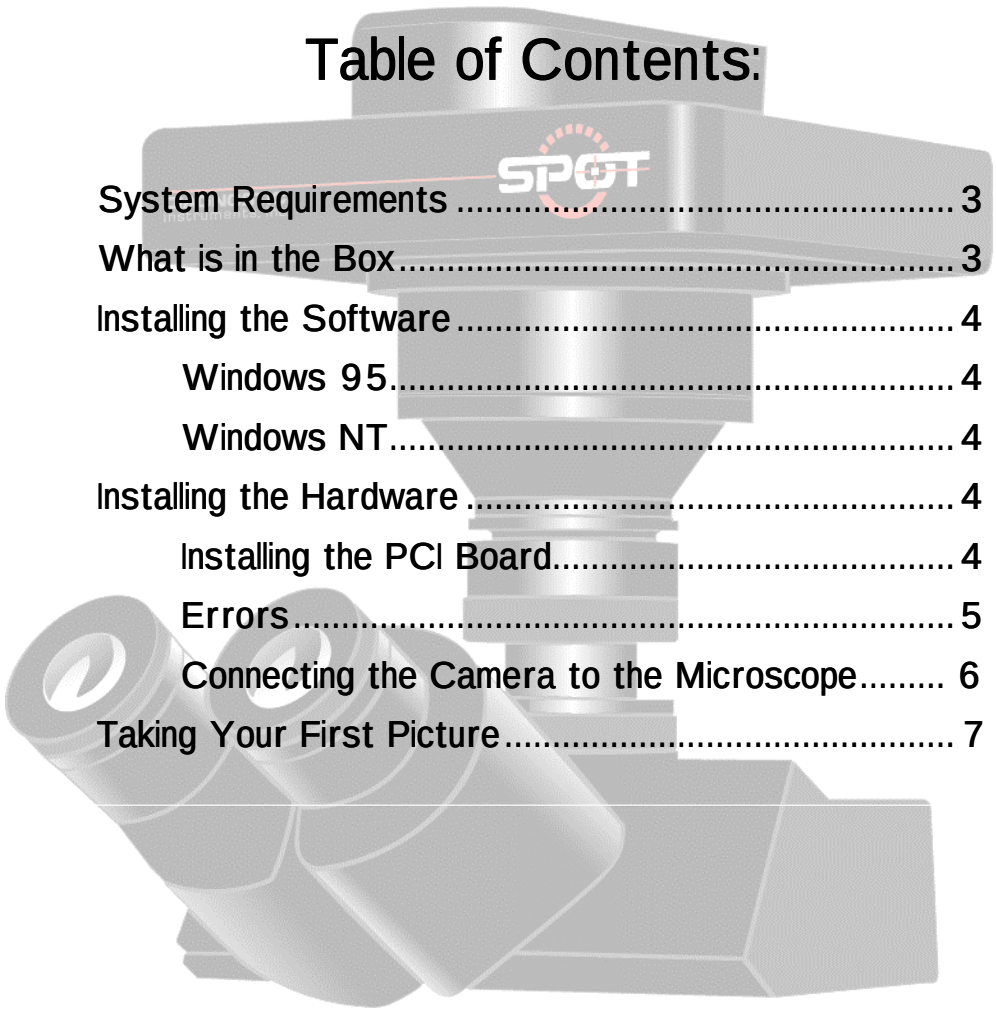

DIAGNOSTIC instruments, inc.

SPOT

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Getting Started: Installing the SPOT Hardware and Software

System Requirements

The following elements are required to run the SPOT camera/software:

- **A Pentium or Pentium II computer** with one of the following operating systems:
  - **Windows 95**
  - **Windows NT**

  Download and image processing times vary according to the speed of your machine. Our experience is as follows:
  - 90 Mhz Pentium - slow
  - 166 Mhz Pentium - average
  - 200 Mhz MMX Pentium - fast
  - 266 Mhz Pentium II - very fast
- **A minimum of 64 Mb of RAM.** Although the software will run with 64 Mb, 128 Mb is recommended for faster operation.
- **A 21 inch monitor with a resolution of 1,600 x 1,200 pixels at a refresh rate of over 70 Hz is recommended for optimal viewing.** The camera and software will work with lower resolution monitors, but by using lower resolution monitors, you limit the ability to display the camera's high resolution capabilities. The Hitachi SuperScan Supreme 803 has worked well for us.
- **A video card capable of supporting 24 bit true color at the desired resolution.** If you use less than 24 bit, true color, you might experience the phenomenon known as *banding* (see the glossary in the manual). We recommend an 8 Mb card capable of 1,600 x 1,200 resolution at a 24 bit true color setting with a refresh rate above 70 Hz (to drive the 21" monitor). The Matrox Millenium II 8 Mb video card has worked well for us.

CAUTION!

Some 8 Mb cards support only a 32 bit true color setting and do not have a 24 bit true color setting. Such cards might not support 1600 x 1200 resolution in their true color mode.

- An available PCI slot.
- **A digital camera coupler designed to fit a camera with a Nikon F Lens mount.** Diagnostic Instruments makes couplers for most microscopes. They are available from the dealer where the camera was purchased.

What is in the Box

In addition to this set of instructions, the shipping box should contain the following items:

- The camera head with a dust cap
- A power supply
- A power cord for the power supply
- A PCI interface board
- A 25 pin cable to connect the power supply to the camera (5 feet long)
- A 68 pin cable to connect the interface board to the camera (10 feet long)
- Grounding wrist strap
- One CD-R that contains:
  - The software required to operate the SPOT camera. This software includes image capture, manipulation, and annotation features, as well as an image database/archiving system.
  - A PDF (portable document format) version of the user manual, *User's Guide to the SPOT Cooled Color Digital Camera*.

  - The Adobe Acrobat Reader software that is required to read and/or print the user's manual.

- A registration card.

Installing the Software

You must install the SPOT software before you install the PCI card and connect the camera. The CD-R disk provided with your camera contains the SPOT software, which can be used with the following operating systems:

- Windows 95
- Windows NT

The following sections detail the installation instructions for each system.

Windows 95

1. Insert the disk into your CD drive.
2. Ensure that all other application programs are closed.
3. If it is open, close the MS Office 95/97 Tool Bar.
4. From Windows Explorer, double click on the CD drive icon, which should appear as SPOT.
5. Double click on the WIN32 folder.
6. Double click on the SETUP32.EXE icon (right pane) to launch the installation program.
7. The InstallShield Wizard guides you through the remaining steps.

Windows NT

1. Ensure that you are logged onto the PC with administrator privileges.
2. Insert the disk into your CD drive.
3. Ensure that all other application programs are closed.
4. If it is open, close the MS Office 95/97 Tool Bar.
5. From Windows Explorer, double click on the CD drive icon, which should appear as SPOT.
6. Double click on the WIN32 folder.
7. Double click on the SETUP32.EXE icon (right pane) to launch the installation program.
8. The InstallShield Wizard guides you through the remaining steps.

Installing the Hardware

There are two main steps to installing the hardware:

- Installing the PCI card into your computer.
- Connecting the camera to the microscope

The next two sections detail these procedures

Installing the PCI Board

CAUTION!

You must install the SPOT software before before installing the PCI card and connecting the camera.

To install the PCI board, follow these steps:

CAUTION!

If you are unfamiliar with the procedures for installing plug in boards, refer the installation to your MIS department or to a qualified computer technician.

1. Turn off the computer, and let it sit for a few minutes to let the power supply drain.
2. Unplug all cables, and remove the power cord from the back of the computer.

WARNING

To avoid electrical shock, always remove the power cord and all external cables, and wait a few minutes for the power supply to drain before opening the case.

3. Place the computer on a clean, uncluttered surface, and remove the cover.

4. Position the computer so that the mother board is facing you.

WARNING

Do not handle the PCI interface board or touch components inside the computer without using the enclosed grounding wrist strap.

5. To discharge any static charge that might have built up on your body, touch your finger to the metal case of the computer's power supply.

6. Stick the copper foil end of the grounding wrist strap to the metal case of the computer's power supply.

7. Loop the other end of the strap around your wrist by pressing the sticky side against the strap, keeping the dark strip against your skin.

8. Use your computer's manual to identify the location of the PCI slot(s) on the motherboard.

9. Remove the metal cover plate adjacent to an available PCI slot. Save the screw.

Note: If possible, avoid installing the PCI card in the shared slot (i.e., the PCI slot next to the first ISA slot.

10. Carefully insert the PCI bus interface board into the PCI slot.

11. Secure the metal bracket back into place with the screw from step nine.

12. Put the cover back on the computer.

13. Reboot the computer.

    If you have Windows 95, the computer should display two messages during the boot up process. The wording of the messages varies according to which version of Windows 95 you are using.

    – The program should initially indicate that it has found a new device.

    – The program should indicate that it has successfully installed the WinRT drivers.

    Windows 95 then prompts you to reboot the computer to complete the installation. Click on Yes to reboot your PC.

    If you have Windows NT, you will not see any messages of this type because NT automatically updates its registry with the new information.

Errors

If, after installing the PCI board you cannot access Windows, or if the camera will not communicate with the PC, one of the following situations might be the cause:

- The slot that you chose for the SPOT PCI board might have previously been occupied by another device's board.
- The PCI slot is in the shared position, (the PCI slot immediately adjacent to an ISA slot).

These are areas that Diagnostics Instruments has found to be problematic on *some* installations. This is due to the fact that Windows

95 is not fully plug and play compliant. To resolve the problem, try plugging the board into another PCI slot.

Connecting the Camera to the Microscope

After you have installed the PCI board, you can connect the SPOT camera to your microscope. Diagnostic Instruments recommends one of the following Nikon F Mount type couplers:

- For wider fields of view, use the HRD060-NIK coupler (0.6x) and the appropriate bottom clamp.
- For greater magnification, use the HRD100-NIK coupler (1x) and the appropriate bottom clamp.

Note: Olympus AX and BX series microscopes can use the shorter, less expensive D10BXF coupler (1x) in place of the HRD100-NIK.

To attach the camera to the microscope, follow these steps:

1. Attach the bottom clamp to the coupler.

Note: If using the D10BXF for an Olympus BX, AX, or MX series microscope, a bottom clamp is not needed..

2. Attach the coupler/bottom clamp to the camera as follows:

   a) Using the LOCK/UNLOCK arrows on the camera, ensure that the lever arm on the camera is in the UNLOCK position.

   b) Place the coupler into the camera, matching the slot on the coupler to the pin on the camera lens mount.

   c) Ensure that the coupler is properly seated to the camera. You might have to wiggle it a bit.

   d) When the coupler is seated, move the camera lever into the LOCK position.

3. Insert the camera/coupler/bottom clamp combination into the microscope's photoport or phototube.

4. Tighten the thumbscrew on the microscope's phototube (or the coupler's bottom clamp) to lock the combination to the microscope.

5. Connect the camera to your computer as follows:

WARNING

Make sure that both the computer and the SPOT power supply are turned off before connecting the cables. Failure to do so can result in damage to electronic components in the camera.

   a) Attach one end of the of the 68 pin cable to the PCI board on the back of the PC, and attach the other end to the camera head.

   b) Attach one end of the 25 pin cable to the power supply, and attach the other end to the camera head.

   c) Plug one end of the power cord into the power supply and the other end into a surge protector.

Taking Your First Picture

Taking a picture is a four step process:

- Preparation of the microscope, specimen, and camera. (1 - 9)
- Performing a white balance computation. (10 - 13)
- Capturing and focusing the initial image. (14 - 20)
- Capturing the final image. (21)

The first aspect of taking a picture is to prepare your microscope and camera.

1. Select the specimen that you want to photograph, and set up the microscope for Koehler illumination.
2. Ensure that the specimen is in focus.
3. Use a daylight filter (5500° K), and set the lamp voltage to the photo setting (or the rated lamp voltage).
4. Insert at least one ND12 and one ND6 neutral density filter into the light path.
5. Open the SPOT software:

   For both Windows 95 and Windows NT, select (from the Start menu) Programs, Diagnostic Instruments, and SPOT.
6. From the Setup menu, select Image Setups The Image Setups window appears with several pre-defined image setups.
7. Single click on the Brightfield option.
8. Click on the Current button, and then click on Close.

The next stage is to perform a white balance computation, where the camera samples your light source and computes the proper ratio between the red, green, and blue exposure values. This ensures that the white areas of your specimen will be white, as opposed to blue or orange. Steps 10 - 13 describe this procedure.

9. Click on the Compute White Balance Values toolbar button:

10. Position the slide so that the specimen is not in the field of view (i.e., a white area), and click on the Begin button.
11. Click on OK when the process is finished.
12. Move the specimen back into the field of view.

The third aspect of taking a picture is to capture an image. This is described in steps 14 - 20.

Note: The initial image will be out of focus, but it is useful as a guide for positioning the focus window, as described below.

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13. Click on the Get Image (exposure from setup) toolbar button:

    Following a series of clicks, the image is downloaded to your screen.

14. Click on the Focus toolbar button:

15. Use the cursor to drag the focus rectangle to a high contrast, detailed area in the image.
16. Click on the right mouse button to open the Focus window. Choose a color that will give you the best focus contrast. Click on a color to see a preview.

17. Select Medium as the speed.

Note: If the image is too grainy at the Medium setting, try using either the Slow or the Slowest setting.

18. Click on the Begin button, and focus the microscope or coupler.
19. When the specimen is in focus, click on the Close button.

Having focused the original image, you can now take the final exposure.

20. Click on the Get Image (exposure from setup) toolbar button:

21. To receive **FREE** software updates for **ONE YEAR**, fill out and send in the enclosed registration card.